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The Grand Prize

At the World's Fair, St. Louis, 1904, the highest ever given in this country, was awarded to Walter Baker & Co. Ltd. for the superiority of all their Cocoa and Chocolate preparations.

They have received 45 highest awards from the great international and local expositions in Europe and America.

COCOA TREE.

(From an Old Print.)

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DESCRIPTION
OF THE
EDUCATIONAL EXHIBIT
OF
COCOA AND CHOCOLATE

* * *

BY
WALTER BAKER & CO. Ltd.

DORCHESTER, MASS.
1905.

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The Barta Press, Boston.

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INTRODUCTORY.

IN 1886 we published a short history of the production and use of cocoa and chocolate (a duodecimo of 152 pages), which contained some curious and valuable information collected from sources not available to most English readers. The edition of ten thousand copies issued at that time was received with so much favor by those interested in the science of nutrition that the supply was soon exhausted. In 1891 we issued another work of 40 pages in quarto form, entitled "The Chocolate Plant and its Products," which contained much additional matter of value relating to the habits of the plant and the preparation of the fruit for domestic use. In 1899 we published a book in quarto form containing 72 pages, entitled "Cocoa and Chocolate," a short history of their production and use, with numerous illustrations of the cocoa tree and its products, and of Walter Baker & Co.'s manufactory, the oldest and largest establishment of its kind on this Continent. Two editions of this book containing new matter have since been issued to meet the popular demand. These publications can be found in many of the public and school libraries of the United States; but in order to meet the often expressed want of teachers in the public schools, we have prepared the accompanying exhibit of samples of the different products to enable teachers in their class lectures to demonstrate the actual transformation of the cocoa seeds from the raw material to the health-giving Breakfast Cocoa and Chocolate of to-day.

This publication gives

I. A description of the different articles contained in the exhibit.

II. Early use of Cocoa and Chocolate, and present production and consumption.

III. A description and analysis of the Cocoa Seeds.

IV. A description of the tree, its habitat, and the gathering and curing of the crop.

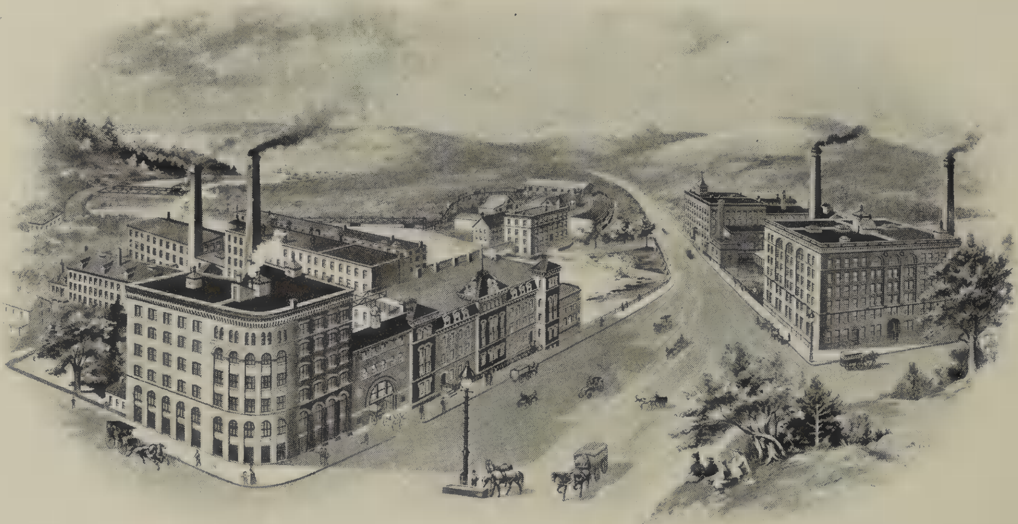
V. Some testimonials as to the food value of the fruit when properly prepared for domestic use.

Registered U. S. Patent Office.

DEFINITIONS.

Cocoa. The commercial name given (1) to the seeds of the small tropical tree known to botanists as *Theobroma Cacao;* (2) to the cracked or coarsely ground product of the roasted seeds, sometimes designated more particularly as "Cocoa-nibs," or "Cracked Cocoa"; (3) to the finely pulverized product of the roasted seeds from which a portion of the fat has been removed, sometimes designated as "Breakfast Cocoa," or "Powdered Cocoa."

Chocolate. (1) The solid or plastic mass produced by grinding to fineness the kernel of the roasted seeds of *Theobroma Cacao* without removing any of the fat; sometimes called "Plain Chocolate," or "Bitter Chocolate"; (2) the same product to which have been added sugar and various flavoring substances, sometimes known as "Sweet Chocolate," or "Vanilla Chocolate."



BIRD'S-EYE VIEW OF WALTER BAKER & CO.'S MILLS, DORCHESTER, AND MILTON, MASS.

I.

DESCRIPTION OF EXHIBIT.

Exhibit No. 1 is a sample of the Cocoa-bean, or Cacao-seed, as it is received by the manufacturer.

This material is the basis of the entire manufacture of Chocolate and of Breakfast Cocoa. In the condition here presented, it possesses no attractiveness of flavor; but upon being subjected to a degree of heat sufficient to roast it thoroughly and evenly, it acquires the fine aroma and taste of pure unsweetened chocolate. The manufacture of the seeds into chocolate and the other well-known products is a complicated process, of which the following general outline is here given, in order to show, in their proper order, what the other features of this educational exhibit are.

The cleaned seeds are first roasted in the most careful manner, every precaution being taken to secure a uniform effect through the whole mass. During the roasting, the seeds change color somewhat, and become more or less modified in taste. In under-roasted seeds the flavor is not fully developed, while in over-roasted seeds the pleasant taste is likely to become greatly impaired, or it may even be wholly replaced by a bitter and harsh flavor. The relations of color and taste to the roasting of the seeds make this portion of the manufacture one of the most delicate processes from beginning to end.

By the roasting, the shell becomes more readily detachable, and its complete removal is the next step. The crushing of the seeds into small fragments is easily accomplished, and this is followed by a thorough winnowing, by which the shells are carried away by themselves, leaving the clean fragments of the roasted seeds ready for further manipulation.

Among the fragments can be detected minute and very tough bits of tissue. These bits are the hardened germs, or rather portions of the germs, and these are separated from the rest by an apparatus of much simplicity and efficiency. The result of this process gives us

Exhibit No. 2, Cocoa-nibs. The cleaned fragments constitute the so-called "Cracked Cocoa," or "Cocoa-nibs," and in this state they are used for a simple decoction. In this form they require to be boiled a good while for the development of the flavor, and it is therefore better to have them treated beforehand in order to reduce the time of boiling; and this is all the more necessary, since during the long boiling a part of the more delicate aroma peculiar to chocolate seeds is apt to be dissipated.

In the preparation of chocolate, cocoa-nibs are ground by a complicated mechanism until they attain the greatest degree of fineness, and constitute a perfectly homogeneous mass or paste. If the chocolate is to be a plain chocolate, it is to receive its delicate manipulation and then go directly into the molds for shaping it. Every step of the process has to be watched with the most assiduous care. When the chocolate is formed and properly cooled, it is wrapped and packed for the market, and is represented in the finished product as "BAKER'S CHOCOLATE" (blue paper and yellow label).

But if the chocolate is to be sweetened, a definite amount of the purest sugar, previously pulverized, is to be added, the whole ground and commingled, and the semi-solid mass formed in molds as before. After being molded it is sent to the packing room and wrapped, and is represented in the finished product by GERMAN SWEET CHOCOLATE. This is one of the most popular sweet chocolates sold anywhere. It is palatable, nutritious, and healthful. It is a great favorite with children, and is an excellent substitute for much of the confectionery now offered to the public.

BAKER'S VANILLA CHOCOLATE (white label) is manufactured from the cocoa-nibs, under the same process as BAKER'S GERMAN SWEET, but from different blends of the cocoa-nibs, and with the addition of the vanilla bean. BAKER'S VANILLA CHOCOLATE is perhaps the best example of the high standing of the American manufacture, as at the Paris Exposition of 1878 it was awarded the Gold Medal.

The variations in the process are innumerable, but all of them are comparatively unimportant when taken singly; the skill in the manufacture requires that each of these slight changes should be made in just the right time and in the right way. In the manufacture of Walter Baker & Co.'s Chocolate this skill has been developed to a very high degree during more than a century of successful endeavor. That the firm is ready to avail itself of every appliance known in modern manufacture is seen by their adoption of the complicated machinery illustrated on page 39. This chocolate machine has a capacity of ten thousand pounds of sweet chocolate daily.

Exhibit No. 3 is the oil of the cocoa seed, or what is more generally known as Cocoa Butter. It is perfectly wholesome, but there are some persons who find the percentage of oil in the natural seed too high for easy digestion. The removal of a part of this, which might with propriety be called an excess of the oil, was practised even in very early days, but the degree of excellence which the cocoa consumer demands has led many manufacturers to adopt various methods for making their powdered cocoa, some of which are very crude. In order to obtain a darker cocoa, some of them have resorted to the use of chemicals and dyés. Walter Baker & Co., from the beginning, have taken a decided stand against any of the so-called chemical processes, and the excellence of their product of Breakfast Cocoa has, by a careful study of the best mechanical methods, been fully maintained by them. The enormous increase in the consumption of their product indicates that a discriminating public appreciates a thoroughly good article.

Exhibit No. 4. Powdered Cocoa. The method of manufacture is substantially as follows: The ground fragments of roasted seeds are subjected to pressure, with the result of withdrawing just as much oil as the manufacturer desires to abstract. The pressed mass is, in the most successful process, treated mechanically in such a manner as to divide and subdivide the minute particles until they are capable of passing through a sieve having several thousand meshes to the square inch. But such pulverization as this would, under ordinary circumstances, reduce the mass to a dull and unattractive powder. In the process devised by the firm of Walter Baker & Co., this high degree of fineness is secured without any loss of brilliancy in the powder, the color being of a rich, reddish brown which is not only attractive in appearance, but, when conjoined with the natural chocolate odor and flavor, is characteristic of absolutely pure cocoa of the highest grade.

The product No. 4 is also represented in a sample package of Baker's Breakfast Cocoa. The small can is a perfect facsimile of the half-pound package for sale by all grocers. It is instructive to compare such a cocoa with the cocoas prepared by what is known in chemical technology as the chemical or the Dutch process. The latter are prepared by treatment with alkaline matters which act on the coloring substances in the seeds, increasing the apparent effect of hot water when the latter is added. In chemically prepared cocoas, the exquisite natural odor and flavor of pure roasted cocoa seeds have been diminished or wholly lost by the severe treatment to which the materials have been subjected. In some cases the loss of the natural flavor is sought to be partially supplied by the use of fragrant gums and other perfumes wholly foreign to the natural product.

RECAPITULATION.

Exhibit No. 1. — Cocoa Bean, as received by the manufacturer.

Exhibit No. 2. — Cocoa-nibs, from which plain chocolate is made.

Exhibit No. 3. — Cocoa Butter, which is obtained by submitting the ground cocoa-nibs to pressure.

Exhibit No. 4. — The pulverized cocoa remaining after the excess of cocoa butter has been removed from the ground cocoa-nibs, known on the market as BAKER'S BREAKFAST COCOA.

II.

EARLY USE OF COCOA AND CHOCOLATE.

CACAO, or Chocolate, has played an interesting part in the history of the world. It was not known to the European nations till after the discovery of America, but early in the sixteenth century it was accepted by the Spaniards as a valuable gift from the new world.

The discoverers reported that the Mexicans produced from the almond-shaped seeds of the Cacao-plant, a palatable and wholesome beverage. It was said by the explorers that the natives roasted the seeds and then ground them up with the meal or flour of Maize, together with the sweet juice from the stalks of the Maize or from the Agave. This paste was mixed with water in a curious way. In a rude sort of churn made of pottery, the paste was beaten with water and certain flavoring substances to a thick froth. This froth was almost too thick to drink; it appears to have been of the consistence of a thin custard.

In the native tongue, water was called latl: to this word was prefixed the word said to have been suggested by the noise made by the dasher in the chocolate churn, namely, *choco.* This compound word, chocolatl, is found to-day, in some form or other, in the languages of all civilized people. Another appellation of the drink was cacohuate.

In Prescott's Conquest of Mexico, there are citations which show the importance of chocolate in the life of the natives of Mexico. A few of these citations are here quoted: —

"The emperor (Montezuma) took no other beverage than the chocolatl, a potation
"of chocolate, flavored with vanilla and other spices, and so prepared as to be reduced
"to a froth of the consistency of honey, which gradually dissolved in the mouth. This
"beverage, if so it could be called, was served in golden goblets, with spoons of the
"same metal or of tortoise-shell finely wrought. The emperor was exceedingly fond
"of it, to judge from the quantity, — no less than fifty jars or pitchers being prepared
"for his own daily consumption! Two thousand more were allowed for that of
"his household."

Again

"The favorite beverage was the chocolatl, flavored with vanilla and different spices.
"They had a way of preparing the froth of it, so as to make it almost solid enough to
"be eaten, and took it cold."

This was obviously a sort of chocolate blanc-mange.

"The froth, delicately flavored with spices and some other ingredients, was taken
"cold by itself. It had the consistency almost of a solid; and the 'Anonymous

"'Conqueror' is very careful to inculcate the importance of 'opening the mouth wide, "in order to facilitate deglutition, that the foam may dissolve gradually, and descend "imperceptibly, as it were, into the stomach.'" It was so nutritious that a single cup of it was enough to sustain a man through the longest day's march.

M. Brillat-Savarin, in his entertaining and valuable work, *Physiologie du Goût*, says: "Chocolate came over the mountains [from Spain to France] with Anne of Austria, daughter of Philip III, and queen of Louis XIII. The Spanish monks also spread the knowledge of it by the presents they made to their brothers in France. It is well known that Linnæus called the fruit of the cocoa-tree *theobroma*, 'food for the gods.'"

The earliest notice of the sale of Chocolate in England is contained in the *Public Advertiser* of Tuesday, June 16, 1657 (more than a hundred and thirty years after its introduction into Spain), stating that "In Bishopsgate Street, in Queen's Head Alley, at a Frenchman's house, is an excellent West India drink, called chocolate, to be sold, where you may have it ready at any time; and also unmade, at reasonable rates."

Chocolate was first manufactured in this country in 1765, in a mill on the Dorchester side of the Neponset River, at a point long known as Milton Lower Mills. Fifteen years later the plant came into the possession of Dr. James Baker, and the small beginning then made of a new industry has developed into the world-famous manufacturing establishment known as Walter Baker & Co. Ltd.

The various kinds of cocoa may be placed in about the following order of merit: Finest Caracas (called Chaou) of Venezuela; the finest Maracaibo (of which very little, if any, is produced of late years); the finest Magdalena, of New Granada, of which the production is small and rarely exported; Soconusco, from the State of that name in Mexico; Java, from the island of that name; the finest Guayaquils from Ecuador. The cocoas from Trinidad, Surinam, Grenada, Para, Bahia, and Africa are classed as "good ordinaries."

An estimate of the world's production of Crude Cocoa in 1903 was 126,795,074 kilograms or 279,532,420 pounds. The estimated consumption of Crude Cocoa in Europe and the United States in 1903 was 127,452,366 kilograms or 280,981,486 pounds. The consumption in the United States in 1860 was only about ⅗ of an ounce for each inhabitant. In 1904 the consumption was over 14 ounces for each inhabitant.

In 1903 the countries from which the main supplies of Crude Cocoa were drawn took rank as follows: 1, Ecuador; 2, San Thomé; 3, Brazil; 4, Trinidad; 5, Venezuela; 6, San Domingo.

The countries consuming the largest amount of Crude Cocoa in 1903 took rank as follows: 1, the United States; 2, Germany; 3, France; 4, Great Britain; 5, Holland; 6, Spain. In 1893 the United States stood fifth in the list of consumers, and France had the first place.

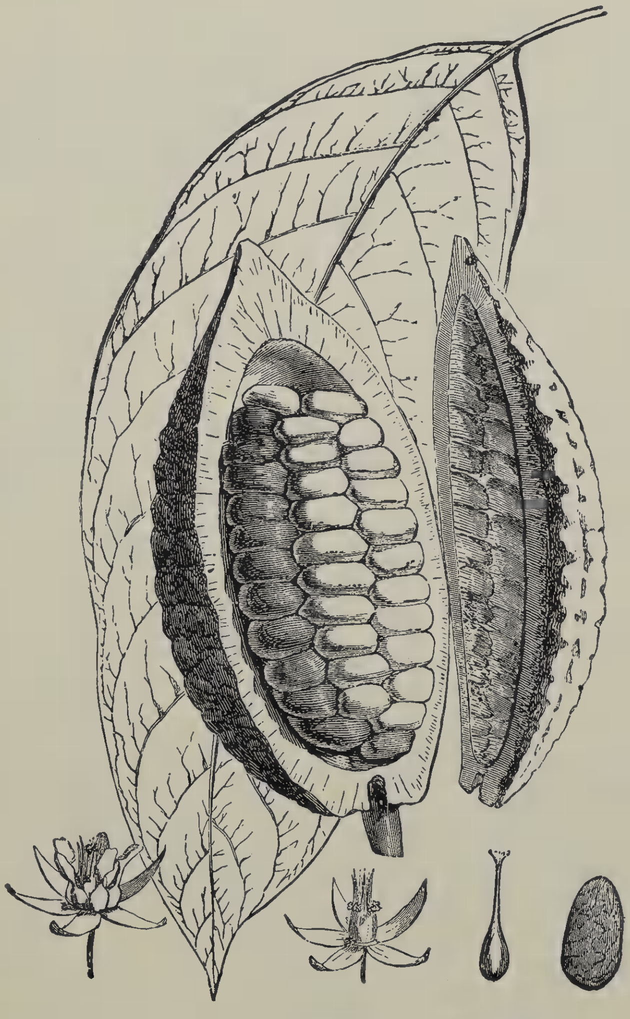
III.

A DESCRIPTION AND ANALYSIS OF THE COCOA SEEDS.

THE seeds of the chocolate plant are brought into the market in their crude state, as almond-shaped "beans," which differ in color and somewhat in texture. It is not uncommon to find the external surface of the bean more or less covered with a thin, irregular layer of attached earth, but this is generally pretty well cleared off during transportation. Upon the color of shell and kernel, the relative brittleness, the flavor and the odor, depend the market value of the seeds.

The dried seeds have a papery, brittle shell, which is very smooth on the inside, but on the outside exhibits, under the microscope, a few short hairs and round excrescences. But these are mostly lost by the rough handling and by the attrition of the seeds with one another during transportation. The kernel consists of two large cotyledons or seed leaves, reddish gray or reddish brown, with a shining, oily surface, the whole crushing rather easily into a loose mass of fragments. The kernel, when dry, has a minute, tough, almost stony radicle, which separates easily from the cotyledons.

Microscopic examination shows that the cells of the kernel contain various protein matters, considerable oil, a small amount of starch, some coloring substances contained in special receptacles. Of course, besides these substances, there are to be found the structural constituents, such as cell-walls of diversified forms, ducts, etc. Concerning a



FLOWERS, FRUIT, AND SEEDS OF THEOBROMA.
From a recent drawing.

few of these matters, a little more detail may be here given, together with a few facts bearing on the chemical constitution of the seeds.

The starch grains do not have any very characteristic form or markings; they are generally small, spherical, and simple. The only peculiarity worth mentioning is the relative slowness with which they are acted upon by hot water and by iodine. The coloring substances are mainly of a carmine or violet color, and are distinguished by the change of shade when an alkali is added, becoming thereby darker.

These are the only structural elements which a pure powder or paste of chocolate should show under the microscope. Any other substances must be recognized as accidental or intentional additions.

All seeds of whatever kind contain, as a part of their substance, the matter of which cell walls are made; namely, cellulose. The percentage differs in different seeds, in those of the chocolate plant being about three in the hundred. Cellulose has the same chemical composition as starch; but its physical properties are not the same as those of starch, among which may be mentioned its entire insolubility in boiling water.

Starch forms, on an average, six to ten per cent. of chocolate seeds. It consists of minute spherical grains, not distinguishable from that found in many other kinds of seeds. Traces of gum and of other allied bodies are also present in the seeds.

Albuminoids, or substances resembling, in a general way, the albumen of egg, occur in chocolate seeds as they do in other seeds, and in a somewhat higher amount than in certain other cases in which the seeds are used as food. The percentage ranges from about fifteen to twenty, depending on the variety. These albuminoids are compounds of nitrogen, and are extremely nutritious. In the roasted seeds they occur in a readily assimilable form, fit for digestion.

Cacao red occurs as a coloring matter in small amount. It is rendered dark by alkalies.

Theobromine, the active principle of the cocoa bean, constitutes less than one per cent. of the weight of the seeds, but it varies greatly in amount in different seeds, ranging from $\frac{30}{100}$ of one per cent. in some, to a trifle over one per cent. in others.

The ash left, on completely burning cocoa beans, is not far from four per cent. Its composition is substantially that of the ash of seeds of other plants.

Cocoa butter, or oil, constitutes not far from fifty per cent. of good cocoa beans. The oil is remarkable for its freedom from rancidity and its very bland character. Its uses are innumerable.

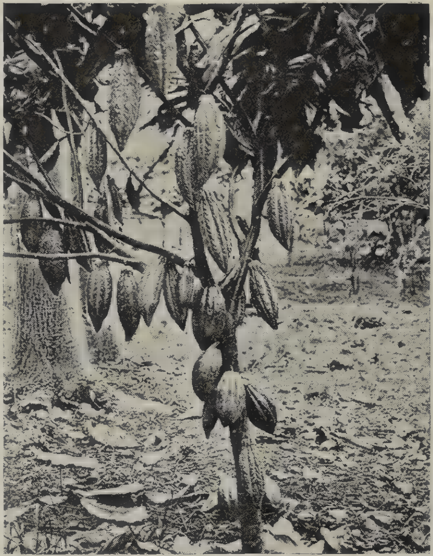
The following averages of many analyses by leading recent authorities will be of interest : —

UNROASTED.		ROASTED.	
Moisture	7.11	Moisture	6.51
Oil	51.78	Oil	49.24
Theobromine	.35	Theobromine	.43
Starch	5.78	Starch	10.43
Cellulose	3.1	Cellulose	3.1
Other carbohydrates, glucosides, etc.	10.05	Other carbohydrates, glucosides, etc.	7.78
Protein matters	15.61	Protein matters	18.33
Ash	3.60	Ash	3.92

IV.

THE TREE PRODUCING "COCOA" AND CHOCOLATE.

THE tree is properly called the "Cacao," a term which was undoubtedly much like the name employed by the natives of Mexico, where the plant was first brought to the notice of Europeans. This name "Cacao" it retains in most European languages, but in English, very curiously, it has been transformed into the word "Cocoa," a word which belongs strictly to the Coco-nut of the Tropics. This singular corruption of the word leads also to an occasional confusion of the nutritious "Cacao" with the medicinal *Coca*, a plant totally different from the Cacao and from the Coco-nut, as well. This corruption of the native term has become so thoroughly incorporated into the English language that we may employ it interchangeably with the other. The Cacao-tree belongs to the natural order or family, Sterculiaceæ, a group comprising almost fifty genera and above six hundred species, all of which are tropical or subtropical. The order is closely allied to the natural family Malvaceæ, to which our



FROM A RECENT PHOTOGRAPH OF A
COCOA TREE IN THE ISLAND
OF JAMAICA, B. W. I.

mallows and cotton belong. Its most important plant, besides Cacao, is *Cola*, widely known as a medicinal agent of considerable value.

The latest and, in some respects, the best accounts of the order Sterculiaceæ, are given by Mr. J. C. Willis, in his admirable treatise on "Flowering-plants and Ferns," and by Schumann, in Engler's great work entitled "Die natürlichen Pflanzenfamilien." From these works, the following details, freed somewhat from technical terminology, are given for reference. The plants of the order are trees or shrubs (a few are herbs), with alternate stipulate leaves. The flowers are in definite clusters, perfect, usually regular, and are on the plan of five. The stamens are united, by their filaments, more or less into a tube. The pistil is superior, with two to many ovules in the ovary.

In the Cacao plant (Theobroma), the clusters of flowers are borne on the old wood, and give rise to tough fruits shaped much like cucumbers, which contain many almond-shaped seeds. The five-celled ripe pods, from eight inches to a foot in length, are found in two colors; one variety, distinctly yellow, inclined to orange, the other possessing a rich chocolate-brown. But these two marked varieties exist in innumerable variations, as regards size of fruit, size and shape of seeds, etc. The differences in size, shape, and color of the seeds are recognizable by experts as indicative of differences in quality, and upon these differences are based the estimates of value in the commerce of the world.

The following table contains the principle species, the places where grown, and the commercial name: —

Botanical Name.	Where Grown.	Commercial Name.
Theobroma angustifolia	Mexico	
T. bicolor	Brazil	Maranhan. Bahia.
	New Granada	Magdalena.
T. Cacao (sativa)	Australia, Bourbon, Ceylon, Cuba, Dominica, Guadaloupe,	The name of each country.
	Guatemala	Central American.
T. Cacao (sativa)	Guinea	African.
	Hayti, India, Jamaica, Java, Madagascar, Martinique, Mauritius, Philippines, St. Croix, St. Lucia, St. Vincent, Trinidad,	The name of each country.
	Venezuela	Maracaibo. Caracas.

Botanical Name.	Where Grown.	Commercial Name.
T. glauca		
T. Guyanensis	Cayenne	Berbice.
	Surinam	Surinam.
T. microcarpa	Ecuador	Esmeralda.
	Peru	Guayaquil.
T. ovalifolia	Mexico	Soconusco.
T. speciosa	Brazil	Para.
T. sylvestris	Brazil	
	Jamaica	

Of the species mentioned in the list given above, only six are distinguished by certain botanists as entitled to specific rank.

Theobroma cacao which is the most widely cultivated is usually divided by cocoa-planters into several more or less well-marked varieties. It is not known to what these varietal differences can be attributed, but they are unquestionably associated with differences of climate and methods of cultivation.

The following notes compiled from various sources will serve to indicate the more striking peculiarities of the chief varieties.

The pods are small; but the nuts are thick, short, and almost globular, pale crimson in color, and of slightly bitter but agreeable flavor. This variety is becoming scarce, chiefly through the bad policy of replacing decayed trees by inferior specimens. The next variety is the *Forastero*, the best kinds of which are the *Cundeamar*, of two descriptions, one with yellow, the other with red pods. The former is the better, containing large seeds, which, in color and the ease with which they are fermented, resemble the *Criollo.* The third variety is the *Amelonado;* and the fourth and lowest is the *Calabacillo*, whose seeds are small, bitter, and of a dark crimson color.

All the varieties except the *Criollo*, which is probably confined to Venezuela, are known collectively as *Trinitario*, or "Trinidad,"—the best being but little inferior to *Criollo* in the matter of quality, and superior on the score of fruitfulness. Hence Trinidad forms the principal nursery from which plants or seeds are procured for new plantations.

The following statements in relation to the cultivation of the cocoa tree and the curing of the fruit are taken from a report made in 1899 by the United States Consul General at Guayaquil, who obtained his information largely from the Secretary of the Guayaquil Chamber of Commerce.

"Cacao is planted from fresh seed. Four or five are put in each hole, which are 5 yards apart, in rows. Formerly they were 2 or 3 yards apart, but experience has shown that this method does not give the plant sufficient air, light, and nourishment.

"The preparation of land for a cacao plantation consists in clearing it of small trees, underbrush, and weeds, but leaving the large umbrageous trees. The space between the trees is planted in corn, arrow-root, or plantains, the latter in abundance, with the double object of affording shade to the delicate cacao plant and producing an immediate income. These crops are grown until the fifth or sixth year, when the cacao has reached a height of 8 or 9 feet, commences to bear fruit, and enters upon a stage of perfect vitality. Then auxiliary crops cease to be planted and the ground is left clear, save for the umbrageous trees, which generally stand at intervals of 40 or 50 yards. The trees usually selected are the guabo, palo prieto, or guachepeli.

"In the first few years, the plant is pruned occasionally, in order that it may 'run to fruit' more quickly. Manures have never been used, even where the ground has been cultivated for over a century, and no irrigation is practised. The sediment spread over the land by the rains during the rainy season and the decaying vegetation appear to afford sufficient nutriment. In some haciendas, however, the proprietors pile up leaves and other vegetable matter found in the vicinity of the tree at its foot, and also rub down the bark with coarse cloths to destroy the adhering parasites.

"The enemies of the cacao tree are the ardillas, the monkeys, many species of small birds which attack the pod, and various parasites, all but two of which are as yet unclassified. These two are the 'mosquilla' and 'mancha.' Continued vigilance protects the fruit from the parrots, animals, etc., but little has been done to extirpate the parasites of the trunk.

"In the sixth or seventh year, the tree commences to bear, but the pods at this time are very small and scarcely repay the effort to gather them. In the tenth year, the tree reaches full maturity. It then produces on an average 1 pound of dry cocoa of good quality. There are many trees which produce more, especially those which are isolated, some of which have yielded at one picking as much as 7 or 8 pounds. In the province of Oro (Machala), 1½ to 2 pounds per tree is the estimated yield. The tree is in bloom during the entire year, but most of the blossoms fall before fructification, which occurs twice a year, the time varying with the locality.

"The cacao tree grows to a height of 20 or 30 feet; its leaves are evergreen and lanceolated in form; the base of the main trunk attains a thickness of 8 to 10 inches; the bark is hard and of greenish coffee color. The blossom is very small, pinkish white, and waxlike in appearance. It grows directly out of the main trunk and branches. If it fructifies, the petals fall off, and from the stamens, in the course of from fifty to seventy days, an oblong pod is developed. This pod is of golden color, and contains some twenty to thirty-five grains of cacao, enveloped in a gummy liquid, which coagulates on exposure to air. The outer rind of this pod is dark or golden yellow in color and very hard, a sharp instrument being necessary to cut it open. Its size varies, according to the kind of cacao, from 8 to 15 inches long by from 2 to 6 inches thick. The outer rind is marked by longitudinal furrows, more or less pronounced, which indicate the interior arrangement of the seeds. Both the outer rind and the gummy contents of the pod are porous and blacken in color as soon as picked, and in Ecuador are of use only to fertilize the soil upon which they are cast.

"As soon as the pods begin to ripen, they are removed with pruning knives, very sharp, and attached to the ends of long poles, which are lengthened by joints as often as required. As the twigs are very tough the blow with this instrument must be strong and well aimed, and the laborers must be experienced on account of the particular skill that is required and the fatigue that attends handling heavy poles sometimes 30 feet long, with the face continually upturned. Wherever they can be reached, the pods are cut off with a machete. They are heaped in piles by one set of laborers, while another cuts them open and extracts the contents. A sharp pruning knife is used, and the seeds are often damaged through carelessness. For extracting the gummy substance and the seeds, an implement made of a beef rib is used.

"The drying is done on open platforms made of split bamboo and palms, where the cacao is exposed to the sun during three or four days, and, in order that it may dry uniformly and well, laborers are employed to tread it out with bare feet. If not well dried, the bean is apt to ferment, and if excessively dried it shrinks and, finally, turns black. The driers are provided with covers for protection against rain."

The different methods of fermentation are not described here. The prime object of the sweating or fermentation appears to be to change the inside portion of the bean by absorbing into it products obtained from the fermenting and decomposing pulp, and where this is not accomplished by any of the methods, the bean is classed as unfermented, and the product is of lower value.

V.

SOME NOTES ON THE FOOD VALUE OF PURE COCOA AND CHOCOLATE.

NO better evidence could be offered of the great advance which has been made in recent years in the knowledge of dietetics than the remarkable increase in the consumption of Cocoa and Chocolate in this country. In 1860 the amount of crude Cocoa entered at the Custom House, for home consumption in this country, was only 1,181,054 pounds; in 1905 (year ending June 30) it had risen to 71,213,704 pounds. Although there was a marked increase in the consumption of tea and coffee during the same period, the ratio of increase fell far below that of Cocoa. It is evident that the coming American is going to be less of a tea and coffee drinker, and more of a Cocoa and Chocolate drinker. This is the natural result of a better knowledge of the laws of health, and of the food value of a beverage which nourishes the body, while it stimulates the brain.

Pure cacao-products are characterized by extreme delicacy of flavor. But they possess another feature of attractiveness, — a beautiful rich red-brown color which is so truly characteristic, that its name, "chocolate," has passed into many languages as denoting this charming shade. When the cacao product is pure, this shade is not a very dark brown, it inclines rather to a dark red. When the color of a cacao-product is so dark as to appear almost black it is a sure sign that it has been tampered with in the process of manufacture, or else that the original cacao-seed was of poor quality. The uninformed person naturally thinks that the deeper shade means strength. This it never means. The black color simply shows that the manufacturer has seen fit to employ harmful alkaline additions at some stage of the process, or perhaps has preferred to color his goods artificially with coal-tar dyes or with the less injurious lampblack. It may be said, once for all, that black cacao-products must be looked upon with suspicion. They contain foreign matters or else they have been maltreated by chemicals during manufacture. Pure products of the cacao-seed preserve their fine delicacy of flavor from start to finish: black products are impure. Discriminating purchasers know this and recognize the fine reddish-brown as characteristic of a pure product, while it is only among those who do not give proper attention to the matter that a market can be found for the cacaos and chocolates to which alkalies, coal-tar dyes, or lampblack have given an unwholesome darkness.

There are few articles in common use where so simple a test for purity exists.

A well-known medical expert has said: "The recent tendency to interfere with the natural properties and constituents of such a valuable food as cocoa is deeply to be deplored. The removal of the fiber and the excess of fat is all that is necessary to produce the most perfect food beverage known to physiologists, and the best cocoa from the dietetic standpoint is undoubtedly that which is perfectly pure without addition of any kind whatsoever. Some manufacturers add starch or sugar in the mistaken idea that starch properly replaces the fat removed. But in no case can starch take the place of fat in a food, and the result is simply to lower the flesh-forming qualities of the cocoa so treated. Starched cocoa is really a poor food, and should be avoided by all who wish to get the most nutriment at the lowest cost in the form of pure cocoa. Malted cocoa, so much in vogue lately, is merely a fad, and has no actual food value over the plain article. The malt is added because it contains a ferment termed 'diastase,' which has the power of converting starch into sugar, and if the malt retained this power in the cup of cocoa its inclusion could be defended. But the diastase is killed at 175 deg. Fahr., and therefore the digestive action of the malt is entirely destroyed by the addition of the boiling milk or water to the powder or paste in the cup. Inasmuch as malt is inferior to cocoa in actual food value, its addition to cocoa lowers the nutritive value of the beverage.

"The use of hops is also entirely useless as far as practical results are concerned, for if sufficient hops were used to be of any service as a tonic to the stomach, the flavor of the cocoa would be so influenced as to make it quite unpalatable, and as the hops have no nutritive value, the addition is without beneficial results. *The treatment of cocoa with potash is to be strongly condemned, as the slightly increased solubility obtained is more than counter-balanced by the injurious effects of the chemical upon the system, and those who value good health would be well advised to leave such cocoas alone.* Perhaps the most novel departure of late years is the addition of kola to cocoa. Kola is a powerful drug, and contains besides caffeine other potent nerve stimulants of an unknown character. It is impossible to defend on hygienic grounds the addition of such a powerful drug to an article of daily consumption, and though under medical advice, and in exceptional cases, the increase of nerve stimulating properties which kola confers on cocoa may be beneficial, yet to the masses such uncontrolled drugging may be followed by serious consequences. Pure cocoa is so rich in good dietetic properties that to interfere with the normal proportions of the food principles is to notably decrease its nutritive value."

Baron von Liebig, one of the best-known writers on dietetics, says: —

"It is a perfect food, as wholesome as delicious, a beneficent restorer of exhausted power; but its quality must be good, and it must be carefully prepared. It is highly nourishing and easily digested, and is fitted to repair wasted strength, preserve health, and prolong life. It agrees with dry temperaments and convalescents; with mothers who nurse their children; with those whose occupations oblige them to undergo severe mental strains; with public speakers, and with all those who give to work a portion of the time needed for sleep. It soothes both stomach and brain, and for this reason, as well as for others, it is the best friend of those engaged in literary pursuits."

Jean Baptiste Alphonse Chevalier, in his treatise on Chocolate, says: —

"Cocoa and Chocolate are a complete food; coffee and tea are not food. Cocoa gives one third its weight in starch and one half in cocoa butter; and, converted into Chocolate by the addition of sugar, it realizes the idea of a complete aliment, wholesome and eminently hygienic. The shells of the bean contain the same principles as the kernels, and the extract, obtained by an infusion of the shells in sweetened milk, forms a mixture at once agreeable to the taste, and an advantageous substitute for tea and coffee."

François Joseph Victor Broussais, a celebrated physician and member of the French Institute, says: —

"Chocolate of good quality, well made, properly cooked, is one of the best aliments that I have yet found for my patients and for myself. This delicious food calms the fever, nourishes adequately the patient, and tends to restore him to health. I would even add that I attribute many cures of chronic despepsia to the regular use of Chocolate."

Christoph Wilhelm Hufeland, the distinguished German physician, says: —

"I recommend good Chocolate to nervous, excitable persons; also to the weak, debilitated, and infirm; to children and women. I have obtained excellent results from it in many cases of chronic diseases of the digestive organs."

A French officer, author of a "Natural History of Chocolate," says: —

"There lately died at Martinico a counselor, about a hundred years old, who for thirty years past lived on nothing but Chocolate and biscuit. He sometimes, indeed, had a little soup at dinner, but never any fish, flesh, or other victuals. He was, nevertheless, so vigorous and nimble that at fourscore and five he could get on horseback without stirrups.

"Chocolate is not only proper to prolong the life of aged people, but also of those whose constitution is lean and dry, or weak and cacochymical, or who use violent exercises, or whose employments oblige them to an intense application of mind, which makes them very faintish. To all these it agrees perfectly well, and becomes to them an altering diet."

Dr. Nansen, the famous Arctic explorer, in his recent work on "The First Crossing of Greenland" (Vol. I., p. 58), speaks of Chocolate as an important part of the equipment for such an undertaking. "We generally," he says, "used Chocolate in the morning." Referring to tea, coffee, and alcoholic drinks, he says: "Stimulants of this kind, with the exception of Chocolate, which is mild in its effect and at the same time nourishing, bring practically no nutritive substance into the body, and the energy which one obtains in anticipation by their use at one moment must be paid for by a corresponding exhaustion at the next."

Dr. H. C. Sawyer, in his valuable little book on "Nerve Waste," says: —

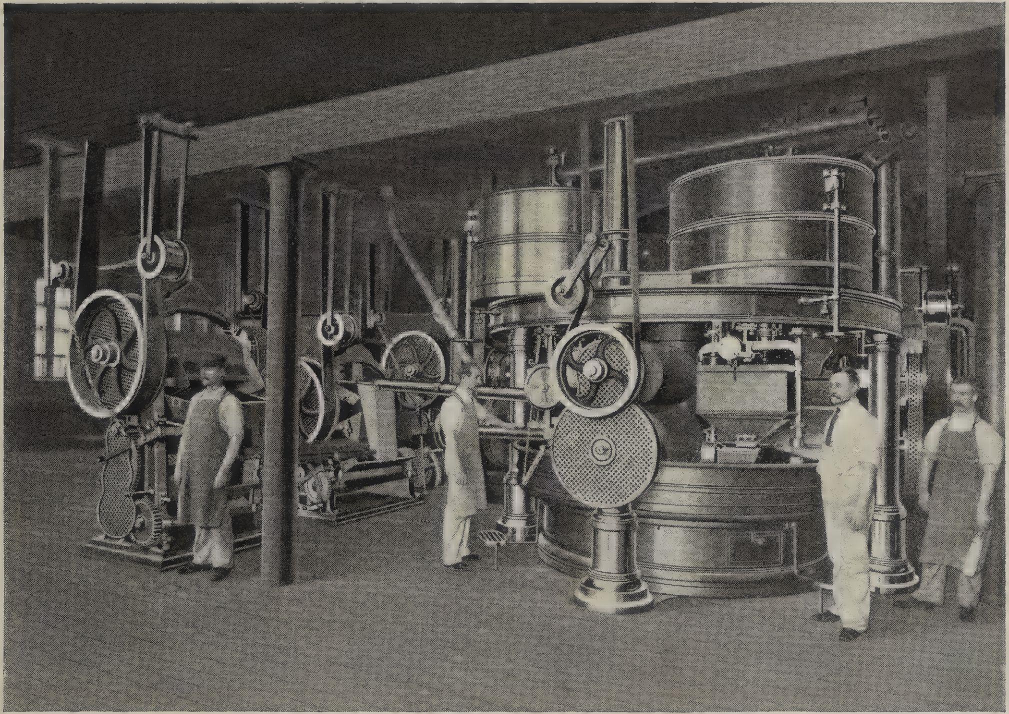
"Baker's Breakfast Cocoa is a light preparation which can be heartily recommended; it contains only so much fat as can be digested by almost any one, and is peculiar in not cloying or palling after a time, as so many Cocoa preparations do. Such a beverage is far more wholesome, and more agreeable, after one becomes used to it, than tea, which is much over-used."

Henry Savage Landor, describing his ascent of the Lumpa peaks, in the Himalayas, the highest point ever reached by man, says that when he reached the top, — 23,490 feet above sea level: —

"I then proceeded to take all the necessary observations — not, however, before having devoured (during the ascent) two whole pounds of Chocolate, which I ate with some snow, to allay my thirst as well as my appetite.

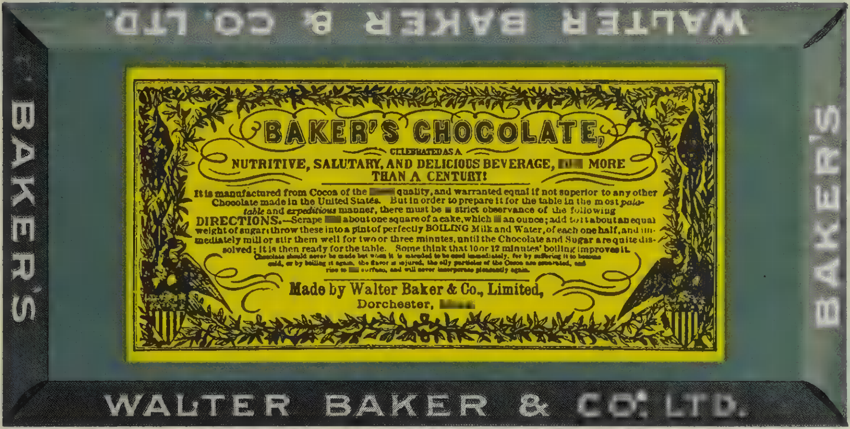
"I had been consuming during the ascent a great many lozenges of highly concentrated meat — each one was supposed to be as good as a meal — and I ate at least fifty in the space of eight hours and a half. I suppose they were sustaining, but one had to eat a great many of them, or they left an awful feeling of emptiness. I had started with my pockets full of Chocolate, and what the lozenges could not do the huge junks of Chocolate I chewed all the way up the mountain certainly accomplished.

"I think it was partly due to the constant nourishment I took that I was thus able to break the world's record in mountaineering, going several feet higher than any one else, and with comparative ease. Had the peak which we climbed been higher, I could have reached a considerably greater elevation."



ONE OF THE CHOCOLATE MACHINES AT THE MANUFACTORY OF WALTER BAKER & CO. LTD.

CAPACITY, FIVE TONS OF CHOCOLATE DAILY.



BAKER'S CHOCOLATE,

CELEBRATED AS A

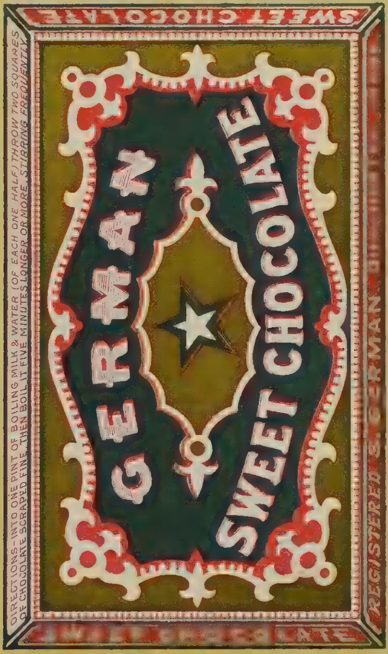
NUTRITIVE, SALUTARY, AND DELICIOUS BEVERAGE, [redacted] MORE THAN A CENTURY!

It is manufactured from Cocoa of the [redacted] quality, and warranted equal if not superior to any other Chocolate made in the United States. But in order to prepare it for the table in the most *palatable* and *expeditious* manner, there must be [redacted] strict observance of the following

DIRECTIONS.—Scrape [redacted] about one square of a cake, which [redacted] an ounce; add to it about an equal weight of sugar; throw these into a pint of perfectly BOILING Milk and Water, of each one half, and immediately mill or stir them well for two or three minutes, until the Chocolate and Sugar are quite dissolved; it is then ready for the table. Some think that 10 or 12 minutes' boiling improves it.

Made by Walter Baker & Co., Limited,
Dorchester, [redacted]

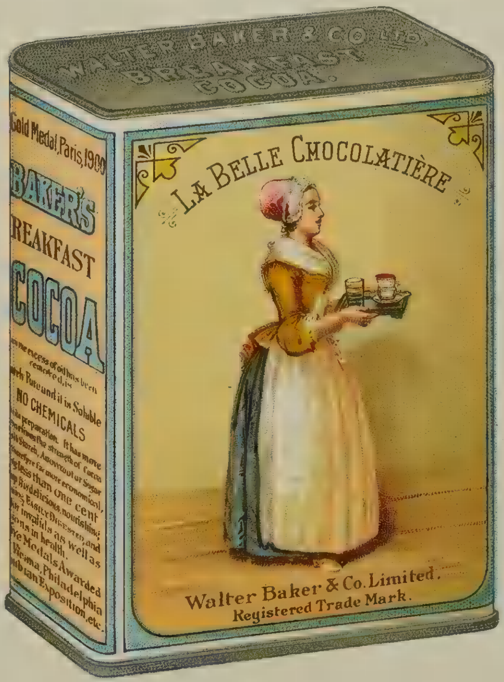
GERMAN
SWEET CHOCOLATE


DIRECTIONS-INTO ONE PINT OF BOILING MILK & WATER (OF EACH ONE HALF) THROW TWO SQUARES OF CHOCOLATE SCRAPED FINE, THEN BOIL IT FIVE MINUTES LONGER OR MORE, STIRRING FREQUENTLY.
GERMAN
SWEET CHOCOLATE
SWEET CHOCOLATE
REGISTERED S. GERMAN

FAC-SIMILE OF ¼ LB PACKAGE

WALTER BAKER & CO'S.

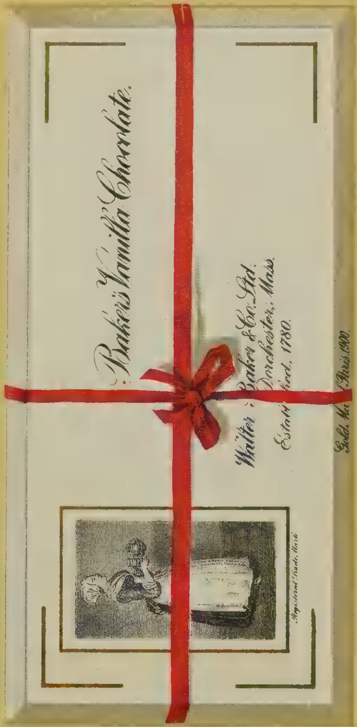
BREAKFAST COCOA



FAC-SIMILE OF ½ LB CAN

WALTER BAKER & CO'S.

VANILLA CHOCOLATE



FAC-SIMILE OF ½ LB PACKAGE

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